Remarks

Claims 1-8 were originally pending in this application. By this amendment, claims 1 – 3, 5 – 6, and 8 have been amended. Claim 4 has been canceled. Claim 7 is unchanged.

Claims 5 and 8 were objected to be cause of the following informality: "a recovery" needed to be replaced by "said recovery". This change was made to claims 5 and 8. In addition, the extra period was deleted from claim 8. Claims 5 and 8 have accordingly been amended and it is believed that these objections are now moot.

Claims 5 was rejected under 35 U.S.C. 112 because the term "the corresponding column" lacks proper antecedent basis. This term has been replaced with "modified by corrupted terms in the received symbol sequence" which has antecedent basis on page 4 line 11 of the specification. The claim has accordingly been amended and it is believed that these rejections are now moot.

Claims 8 was rejected under 35 U.S.C. 112 because the term "the corresponding column" lacks proper antecedent basis. This term has been deleted.

Claims 1-8 were rejected under 35 U.S.C. 103(a) as being unpatentable over applicants admitted prior art fig. 1 in view of Kuchi et al US Patent No. 7,006,579.

Claim 1. The admitted prior art describes signal transmission methods to transmit signals that have been transformed using transmission matrices with orthogonal basis functions, and receive the signals with recovery matrices that are transposes of the transmission matrix.

7

In the Kuchi patent, the non-orthogonal basis functions are comprised of elements that are formed using the symbols, the complex conjugates of the symbols, and the negative complex conjugates of the symbols. Conjugation is not a fixed number, but a mathematical function, an operation upon a number. A recovery matrix for a transmission matrix with non-orthogonal rows cannot be a transpose matrix, it must be an inverse matrix. Fixed matrix elements are required to compute an inverse matrix. Thus, <u>an inverse matrix cannot be computed from a matrix employing elements that are mathematical functions</u>, as taught in the Kuchi patent, and incorporating the admitted prior art with the Kuchi patent is non-obvious. Furthermore, Kuchi does not teach use of an inverse of the transmission matrix. Claim 1 has been modified with the added term "said recovery matrix is an inverse of the transmission matrix" to limit and clarify the claim.

Claim 2. This claim should be allowable because it is dependent upon an allowable claim 1.

Claim 3. It would not be obvious to create an overdetermined matrix with more rows than columns because an inverse matrix can only be created from a square matrix that is non-singular. The term "said recovery matrix is a pseudo-inverse of the transmission matrix" has been added to limit and clarify claim 3.

Claim 4. This claim has been canceled.

Claim 5. This claim should be allowable because it is dependent upon an allowable claim 3.

Claim 6. Cited prior art does not teach transforming a previously transformed signal into frequency domain symbols using a second transform. In claim 6 the order of the transforms performed at the receiver have been switched to reflect

8

the order of the steps in Fig. 5. The term "said recovery matrix is an inverse of the transmission matrix" has been added to limit and clarify this claim. An "a" has been added before "receiver receiving".

Claims 7. This claim should be allowable because it is dependent upon an allowable claim 6

Claim 8. This claim should be allowable because it is dependent upon an allowable claim 6.

Reconsideration of this application is respectfully requested.

Specification
The first correction to the specification is an omission. The second and third corrections correct use of the word "row" when "column" was intended.

Abstract
The abstract has been shortened.

Drawings
"(PRIOR ART)" is be added underneath "FIG 1" in a replacement sheet FIG 1.

The word "ROW" has been replaced with "COLUMN" in a replacement sheet FIG 3. The error is evident when examining the numerical example of FIG 3.

Applicant believes no new material has been added.

9

Reconsideration is respectfully requested. The applicant believes the application to be in condition for allowance, and such action is earnestly requested.

Dated this 19 ᵀᴴ day of June, 2007.

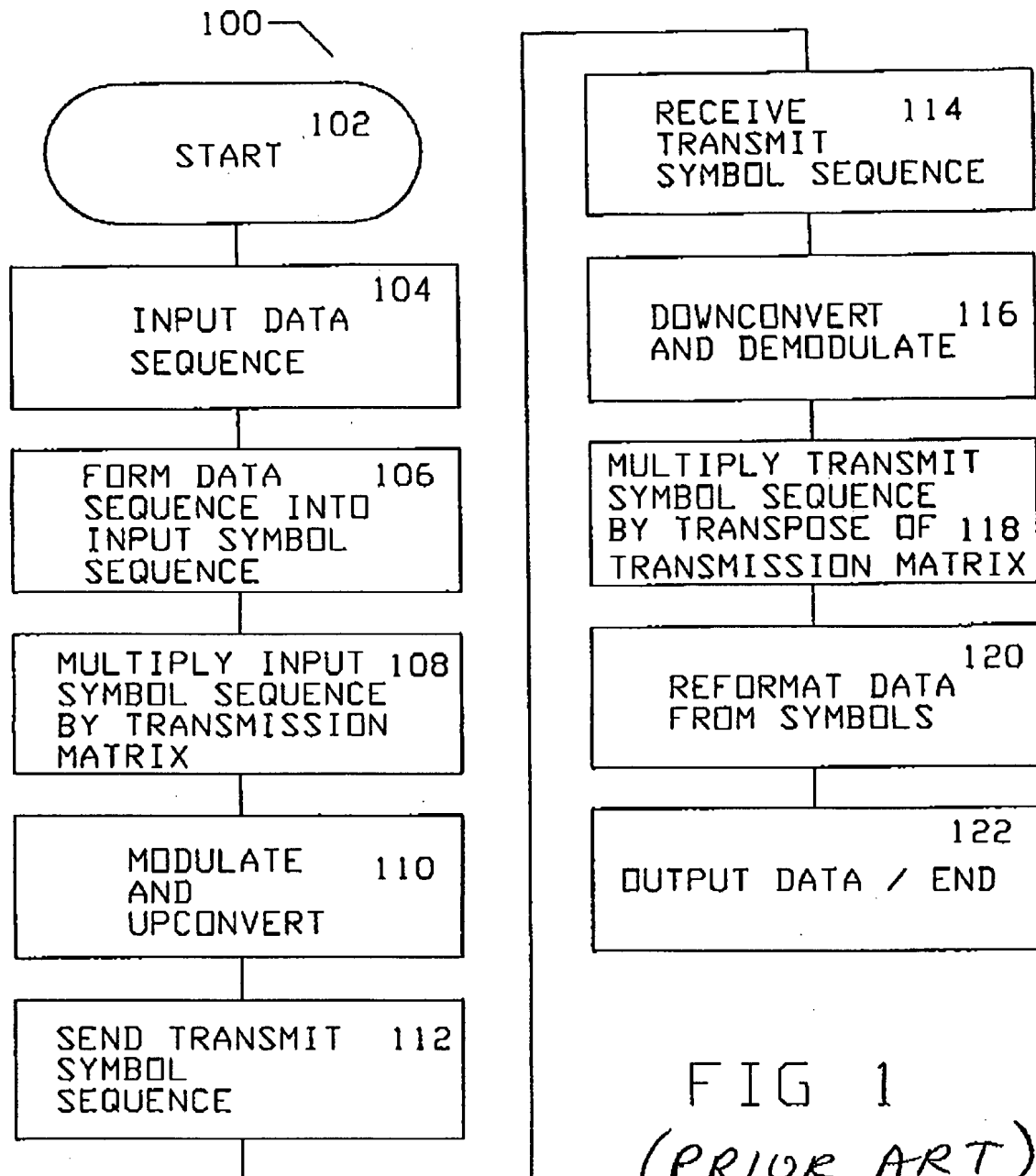Respectfully submitted:

Thomas Holtzman Williams

Thomas Holtzman Williams

I CERTIFY THAT THIS HAS BEEN MAILED

1ST CLASS PARCEL POST ON 6-19-07

Thomas HWilliams

10

ANNOTATED SHEET

100 ⌐

START 102

INPUT DATA 104
SEQUENCE

FORM DATA 106
SEQUENCE INTO
INPUT SYMBOL
SEQUENCE

MULTIPLY INPUT 108
SYMBOL SEQUENCE
BY TRANSMISSION
MATRIX

MODULATE 110
AND
UPCONVERT

SEND TRANSMIT 112
SYMBOL
SEQUENCE

RECEIVE 114
TRANSMIT
SYMBOL SEQUENCE

DOWNCONVERT 116
AND DEMODULATE

MULTIPLY TRANSMIT
SYMBOL SEQUENCE
BY TRANSPOSE OF 118
TRANSMISSION MATRIX

REFORMAT DATA 120
FROM SYMBOLS

OUTPUT DATA / END 122

FIG 1
(PRIOR ART)

ANNOTATED SHEET

/— 300

E=[0 1 0 -1 0] /302   <INPUT SYMBOL SEQUENCE

$$C=\begin{vmatrix} 1 & 2 & 3 & 4 & 5 & 1 \\ -5 & -4 & -3 & -2 & -1 & 4 \\ 3 & 2 & -3 & -1 & -2 & -3 \\ 3 & -4 & -2 & 2 & 1 & 2 \\ 3 & -4 & 5 & 2 & 1 & -3 \end{vmatrix}$$ /—304   <2 DIMENSIONAL
TRANSMISSION MATRIX

F=E·C=[-8 0 -1 -4 -2 2] /306 <TRANSMIT SYMBOL
SEQUENCE

F5=[-8 0 -1 -4 2] /—308   <RECEIVED SYMBOL
SEQUENCE WITH CORRUPT
TERM REMOVED

$$C5=\begin{vmatrix} 1 & 2 & 3 & 4 & 1 \\ -5 & -4 & -3 & -2 & 4 \\ 3 & 2 & -3 & -1 & -3 \\ 3 & -4 & -2 & 2 & 2 \\ 3 & -4 & 5 & 2 & -3 \end{vmatrix}$$ /310   <TRANSMISSION MATRIX
WITH CORRUPT ~~ROW~~ COLUMN
REMOVED

$$K5=\begin{vmatrix} -.3528 & -.4410 & -.3658 & .2529 & -.1712 \\ -.0110 & -.1388 & -.0739 & -.0233 & -.1304 \\ -.2335 & -.2918 & -.3891 & .0350 & -.0545 \\ .6005 & .5006 & .5564 & -.1401 & .2179 \\ -.3268 & -.4086 & -.5447 & .2490 & -.2763 \end{vmatrix}$$ /312   <INVERSE
OF C5 IS A
RECOVERY
MATRIX

G=F5·K5=[0 1 0 -1 0] /314 <OUTPUT SYMBOL
SEQUENCE

FIG 3